

**Terrestrial and Aquatic Species**  
**Biological Assessment**  
**Baldy Mountain Salvage Sale**  
Archuleta County, Colorado



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## Introduction

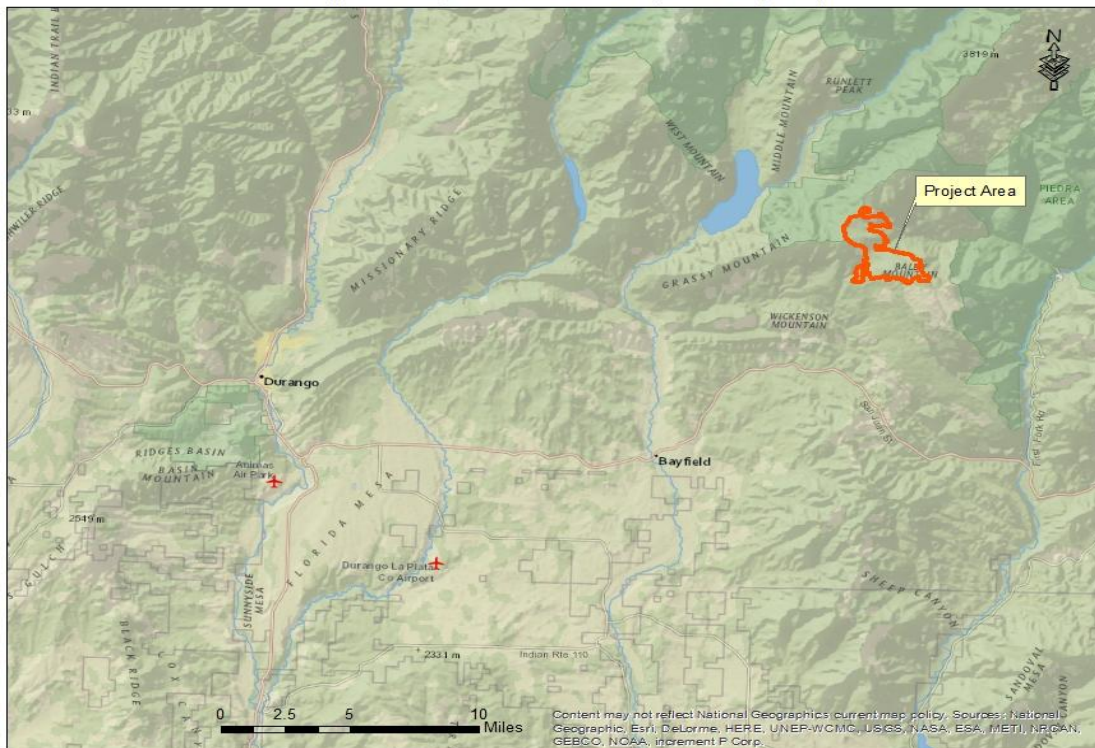
The purpose of this Biological Assessment (BA) is to evaluate the potential effects of the proposed Baldy Mountain Salvage Sale (BMSS) proposal on federally listed terrestrial and aquatic Threatened, Endangered and Proposed wildlife species and Candidates for federal listing as designated by the U.S. Fish and Wildlife Service (FWS) that are known to occur or have the potential to occur on the San Juan National Forest (SJNF).

Analyzing and disclosing the effects of this proposal on federally listed species is required to meet the objectives of the Endangered Species Act (ESA) of 1973 (16 U.S.C. 1531 et seq.) as amended; the National Forest Management Act (NFMA) of 1976 including Forest Service Manual 2670 direction for Threatened, Endangered and Sensitive Species management.

## Location:

The project area is located within Archuleta County, Colorado. The project area is 11 miles northwest of Bayfield, Colorado, east of Vallecito Reservoir and west of the Piedra River. Topography of the project area is diverse and is divided by numerous drainages, steep rocky cliffs, relatively flat benches, open meadows and rocky south facing slopes. The legal description of the project area includes Township 36 N., Range 6 W., sections 13 and 24 and Township 36 N., Range 5 W., sections 7, 17, 18, 19, 20, 30, 28, 29 and 33. Elevation ranges from approximately 10,360 feet to as low as 9,000 feet. Maximum slope is 65 degrees.

Map 1. Baldy Mountain Salvage Vicinity Map

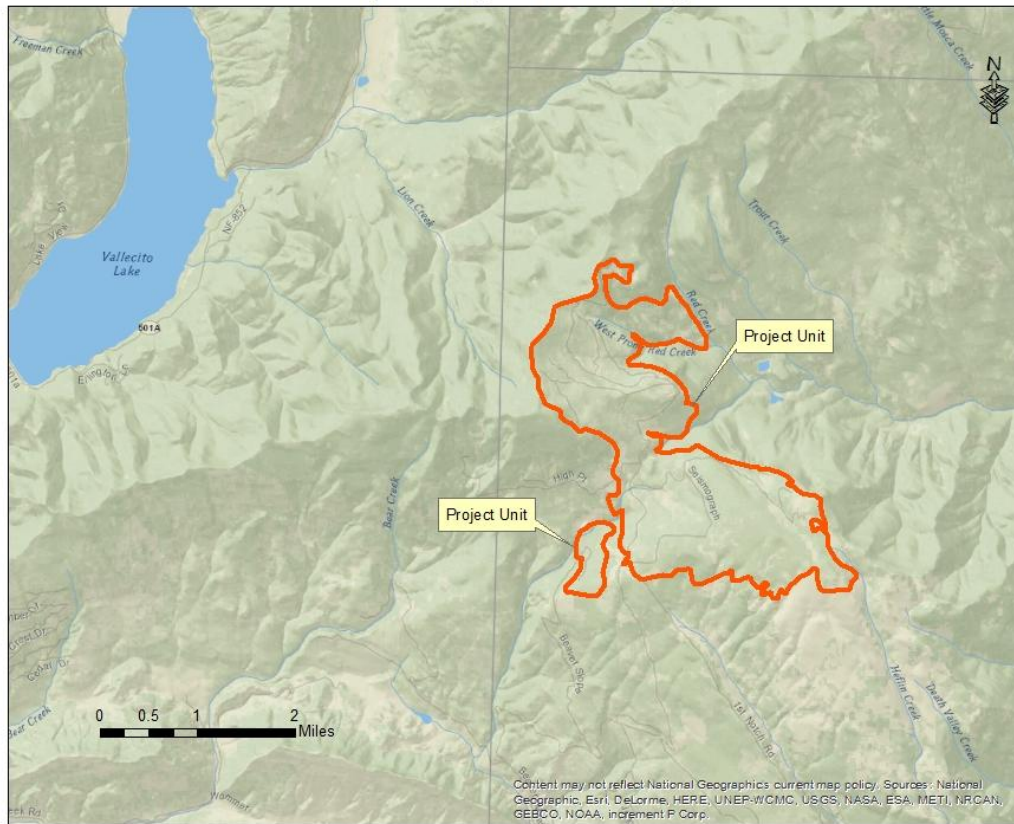


## **Proposed Action:**

The proposed action is a salvage and sanitation harvest of dead and beetle infested live spruce trees. Trees greater than ten inches diameter breast high would be harvested on approximately 2,400 acres within the Baldy Mountain Salvage Sale. Harvest may occur on approximately 700 acres where seven hundred cubic feet or more of dead merchantable tree volume is present. Stands with dominant tree mortality exceeding half of the stand and where harvests would predispose the stand to wind-throw, live dominant and co-dominant live trees would be removed during salvage and sanitation harvest. Areas with shallow soils near ridgetops, pure aspen stands and areas surrounding streams or other hydrological resources would not be harvested.

- Harvests of dominant and co-dominant spruce trees greater than ten inches would take place on approximately 850 acres of high to moderately high bark beetle outbreak potential stands where tree regeneration is present. Harvests would create young, open conditions currently under represented within the spruce-fir forest type of the proposed Baldy Mountain Salvage Sale. Merchantable live aspen in conifer stands may be removed during harvests of dominant and codominant conifers to stimulate aspen regeneration. Pure stands of aspen would not be harvested.
- Other improvement cutting would take place on 850 acres of lightly infested mature, closed canopy forest, predominantly within lower elevation mixed-species stands. Improvement cutting would focus on removal of live trees in poor condition or those that are declining. The goal of this treatment would be to reduce tree competition, improve forest health while retaining the healthiest, most vigorous, wind firm trees. The resulting stand would be a mature, closed canopy forests with a minimum average canopy cover of 40%. However, implementation of improvement cutting would be dependent on changes to stands by spruce beetles. If mortality were to reduce canopy cover below 40% at the time of harvest preparation, which may occur in the next five to ten years, those stands would also be salvaged.
- Harvest areas contain high densities of small trees. Stands would be fully stocked to Forest Plan standards following harvest. In areas such as skid trails, roads, landings and/or poorly stocked microsites where harvest impacts greatly reduce or eliminate the density of small trees, trees would be planted with locally sourced native tree stocks.
- Within harvested areas, appropriate numbers of live and dead standing trees as well as large woody debris on the forest floor would be retained in order to meet requirements set forth in the SJNF Forest Plan (USDA 2013a). Live and dead canopy trees would be retained in areas surrounding stream courses, wetlands or other hydrological features as consistent with the Forest Plan and other applicable resource direction.
- Up to five acres per year of commercial harvest of medicinal herbaceous plants would be allowed as long as the harvest levels do not affect the viability of the population being harvested.

Map 2. Baldy Mountain Salvage



### ***Soils/ Watershed***

Refer to and follow all applicable management measures and design criteria from the Region 2 Watershed Conservation Practices Handbook (FSH 2509.25).

Follow all applicable Best Management Practices (BMPs) outlined in FS-990a, National Best Management Practices for Water Quality Management on National Forest System (NFS) Lands. This would include those listed for Mechanical Vegetation Management activities (pages 128-140).

Heavy equipment and vehicles would be prohibited in the Water Influence Zone (WIZ) unless the ground is protected by either one foot of packed snow or two inches of frozen soil. Intermittent and perennial streams with riparian vegetation would have a buffer strip width of 100 feet on each side of the channel. Wetlands would have a buffer zone distance equal to twice the maximum diameter of the wetland up to a maximum of 100 feet. Natural ponds and stock ponds would have a 150-foot buffer area around the outermost perimeter, i.e., high water line and any adjacent wetlands. Equipment-free buffer zones do not apply to designated stream crossings. Limit stream crossings to the minimum number necessary and cross perpendicular to the direction of flow. Do not cross streams where banks exceed a 30% slope.

Limit equipment operations to sustained slopes less than 35%.

Limit soil disturbance to less than 15% of the treated area.

When soils are saturated, equipment operations would cease until the ground dries out or freezes. Soils are considered saturated when ruts created by equipment are four inches deep beyond the lug tread of the tire for ten feet or longer. This condition should be widespread in the treatment units and not in isolated depressions.

Avoid fens, wetlands and wet meadows during harvest, thinning and prescribed fire activities whenever possible. If temporary access is required through these areas, use mats or raised prisms with diffuse drainage to sustain flow patterns. No skidding, decking or loading would be allowed in these areas in order to protect water quality, groundwater hydrology, existing soils and vegetative cover.

Landings and skid trails would be located and designed to disperse runoff and minimize soil disturbance. Landings should not be located in the WIZ. Roads and skid trails adjacent to the landings would be cross-drained or shaped so that runoff does not reach the landing. Skid trails would be located perpendicular to slope angles along the contour as much as possible. Avoid skidding up or down drainage bottoms. As needed, install water bars or out slope and spread slash on skid trails upon completion of use. Landings would be ripped or scarified and seeded.

Logging slash would be well distributed throughout the cutting units to protect soils from erosion and retain nutrients and organic matter on site and should not exceed two feet in depth or should be piled and burned. Slash piles would not be located or burned within 25 feet of any perennial or intermittent drainage or wetland. Logging debris may not enter perennial or intermittent stream courses to an extent that it adversely affects the natural flow of the stream or diminishes water quality.

Temporary roads shall be held to the minimum feasible number, width and total length and shall be located sufficiently far from streams and other water bodies to minimize discharge into those waters except at necessary water crossings. Stream crossings would be installed on straight and resilient stream reaches as perpendicular to the water flow as feasible. Maintain stream channel width, depth and slope. Culverts placed within the drainage network would be positioned at the natural grade of the drainage and would not be modified, i.e., raised or lowered to maintain the grade of the road. Culverts would be hydrologically designed to accommodate the 10-year flow event and be hardened at the outlets to prevent down-cutting.

Proper drainage would be constructed or reconstructed on existing and temporary roads that would be used. Some road sections may need to be realigned out of low-lying areas in order to allow the road to drain properly. Where roads cross streams or habitually wet dips and the road is open to motorized public use, the road crossing of the stream or dip would be hardened. Wattles and straw bales would be installed and cleaned as needed at the outlets of all water bars and dips during and immediately after treatment operations. All drainage structures on roads should be inspected at treatment completion to make sure they are in good condition and functioning properly.

All temporary roads would have culverts removed; the travelled road surface ripped for the entire length of the temporary road, cross drained, covered with slash or mulch, and seeded to a native seed mix. Where possible and consistent with the Columbine District Travel Analysis Process, road prisms to be decommissioned would be contoured and the natural hydrology restored. A

combination of physical travel barriers such as impassable water-bars, boulders and cull logs would be placed at the intersection of open roads to prevent future public motorized use.

Off-site mitigation for the improvement of watershed conditions would be conducted in the form of hardening stream crossings of system trails in the vicinity.

### ***Vegetation***

Healthy young trees, generally those less than eight to ten inches diameter breast high would be retained during proposed harvests in stands that are dying from insect, disease, or previous fire effects.

As practicable, protect spruce and fir tree regeneration and retain scattered snags during harvest operations.

Removal or mechanical treatment of riparian or wetland vegetation such as willows or cottonwoods would be prohibited.

Stumps from cut trees should not exceed 12" height as measured from the uphill side.

Removal or mechanical treatment of wetland species such as willows or cottonwoods would be prohibited.

Pre-treatment of noxious weeds would occur before project implementation. All equipment brought into the project area would be cleaned and inspected prior to operating. Post treatment of noxious weeds would occur. Infestations of noxious weeds would be inventoried, monitored and treated as necessary within the project area for a minimum of five years after project completion.

Seed mixes would emphasize native species as directed in Forest Plan Guideline 2.2.84, "Certified, weed free native seed mixes of local ecotypes should be used to revegetate terrestrial ecosystems where commercially available. Non-native, non-invasive plant material may be used in limited situations where considered necessary in order to protect resources and/or stabilize soils in a timely fashion. Persistent non-natives or invasive exotic plant species should be avoided."

### ***Cultural Resources***

Avoid known eligible cultural sites indicated in the cultural clearance. Should this not be possible, the district archeologist would provide upon consultation, appropriate mitigation measures to protect eligible resources.

The district archaeologist would be provided 18 months to complete Section 106 compliance work and cultural resource surveys within Areas of Potential Effect (APEs), as the areas to be harvested are identified. Section 106 compliance work would be completed, including the development of mitigation measures for cultural resource protection and any required consultation within these APEs prior to any proposed action implementation.

If a cultural site is encountered during project implementation, they are to be avoided and reported to the district archeologist.

## ***Wildlife***

Except for purposes of safety, no ponderosa pine snags 16" diameter breast high (dbh) or greater would be cut.

Where possible, retain green trees with spiked tops, cavities, lightning scars and trees with apparent multiple cavities.

If an active raptor nest is discovered during layout or implementation, the district biologist would be consulted for mitigation actions.

No treatment would occur within 300 feet of potential southwestern willow flycatcher habitat.

Forested stand openings would vary from 20 to 100 acres.

Off-site mitigation to improve fisheries habitat would be conducted in the form of maintenance of the Jacob's Ladder outlet structure.

From 15 May to 30 June, in mapped elk production areas, operations would be limited to no more than two active work locations.

## ***Recreation***

Any Forest Service system trails that are used for access routes shall be rehabilitated upon completion of use by returning them to the original width and grade. Temporary roads and skid trails would be rehabilitated upon completion of use by seeding as necessary, and by installation of water bars, barriers, boulders, targeted reseeding and/or signs to control unauthorized vehicle use.

## ***Visual Quality***

Retain wind-firm green trees to maintain visual screening dispersed along open roads and trails where there are line-of-sight or travel management concerns.

Cross-country and overland vehicular travel would be rehabilitated as necessary to discourage public use by Off Highway Vehicles (OHV), prevent erosion and limit noxious weeds.

## ***Miscellaneous***

Section corners and survey monuments would be protected.

Fences and other structural improvements would be protected from project activities and repaired.

## Project Access and Timing

The proposed action would also include using approximately 27.6 miles of existing NFS roads and potentially using up to approximately 2.2 miles of temporary overland motorized access routes. Overland access routes would be used to drive equipment into treatment units across the ground surface. They would be temporary in nature, generally not require blading except in specific sites and would be closed and rehabilitated subsequent to project completion. Approximately one mile of existing road would be decommissioned.

The project is expected to be implemented in phases over five years, depending on available budgets, contractor schedules, weather conditions and other unpredictable factors. It is not unusual for a project of this size to require seven to 10 years to be completed.

## Vegetation

The proposed project area is approximately 3,071 acres of which 2,400 acres may be treated by one of three prescriptions. All treatments would occur within the project area perimeter. Exact locations of the 2,400 acres to be treated may change as a result of spruce beetle activity and apparent mortality of canopy trees.

1.

No pure aspen stands would be harvested nor would any harvest occur on shallow soils near ridgetops and areas surrounding streams would be avoided.

**Table 1. Existing Vegetation.**

	Acres
Mountain Grasslands	110.8
Riparian	32.4
Aspen	112.8
Aspen with Conifer	986.9
Cool Moist Mixed Conifer	33.3
Spruce-Fir	1,793.9
Open Water	1.1
<b>Total</b>	<b>3,071.2</b>

**Table 2. Vegetation by Structural Stage for selected vegetation types.**

<u>Vegetation Type</u>	<u>Structural Stage</u>	<u>Acres</u>
Spruce-Fir	4C	0
Spruce-Fir	4B	736.4
Spruce-Fir	4A	517.7
Spruce-Fir	3C	0
Spruce-Fir	3B	387.2
Spruce-Fir	3A	152.1
Cool-Moist Mixed Conifer	4B	15.6
Cool-Moist Mixed Conifer	3B	16.5
Aspen	4C	35.5
Aspen	4B	25.1
Aspen	4A	0
Aspen	3C	13.6
Aspen	3B	27.9
Aspen	3A	9.6
Aspen with conifer	4C	84.6
Aspen with conifer	4B	330.5
Aspen with conifer	4A	226.0
Aspen with conifer	3C	30.6
Aspen with conifer	3B	208.0
Aspen with conifer	3A	105.6

### **Field Reconnaissance**

Field visits to the proposed project area were conducted in 2018 by Albert Fischer, project wildlife biologist.

### **Consultation History**

On 27 March, Aimee Crittendon of the U.S. Fish and Wildlife Service, Matthew Tuten and Albert Fischer of the U.S. Forest Service discussed this project. Due to the size of this project, 1,422 acres of which occurs in suitable lynx habitat and the changing nature of the stands due to bark beetle activity, an assumption would be made that dense horizontal cover existed throughout the stands in the areas proposed for treatment. We also concluded that because the project description involves the removal of green spruce, fir and some aspen, this project was not exception 3 to Veg S6; this was a conversion of suitable lynx habitat to stand initiation stage. We discussed elements of the biological assessment being prepared to provide to the Fish and Wildlife Service and the likely effects determination.

In February of 2013, the SJNF completed a BA for the Forest Plan of 2013 that included water depletions occurring on National Forest System Lands in the upper Colorado River Basin and the San Juan River Basin (USDA Forest Service 2013a). The BA addressed the adverse effects of

water depletions to four of the listed species, the Colorado pikeminnow, the razorback sucker, the humpback chub, and the bonytail, which occupy the upper Colorado River Basin and/or the San Juan River Basin. Specifically, the BA indicated that “it is unknown exactly how many [livestock] grazing facilities might be constructed over the life of the Land and Resource Management Plan [Forest Plan], but it is expected that the associated cumulative net depletion amount will be less than 5 acre-feet (AF) per year”. In August of 2013, the Fish and Wildlife Service provided the Forest with a Biological Opinion (BO) including “reasonable and prudent alternatives” addressing these actions (ES-6-RO-13-F-GJSJ003-TAILS-06E24100-2013-F-0133). The Biological Opinion (BO) acknowledges the anticipated yearly water depletions within the San Juan River in the amount of “2.5 AF per year of depletions associated with livestock grazing activities and up to 9 AF per year of depletions associated with road maintenance and construction.” Additionally, the BO indicates that “as long as the activities described in this section do not exceed the depletion amount of 11.5 AF per year [2.5 AF for livestock grazing and 9 AF for road maintenance and construction] within the San Juan River, no further section 7 consultation is required.”

In January of 1996, the SJNF completed a programmatic BA for water depletions occurring on National Forest System lands in the upper San Juan River Basin. The BA addressed the adverse effects of water depletions to four of the listed species, the Colorado pikeminnow, the razorback sucker, the humpback chub, and the bonytail, which occupy the upper Colorado River Basin and/or the San Juan River Basin. In March of 1996, the Fish and Wildlife Service provided the Forest with a BO including “reasonable and prudent alternatives” addressing these actions (GJ-6-CO-96-F-003). The BA and BO provide a comprehensive description of species life histories, limiting factors and effects rationale. Please refer to these documents for an in-depth discussion of the effects of water depletions to upper Colorado and San Juan River Basin fish populations. Since the 1996 consultations, the SJNF has completed formal consultation on numerous actions that result in water depletion to the upper San Juan River Basin. If needed, we can provide the FWS with additional information specific to these actions.

### **Federally Listed Species**

Table 3. Federally listed terrestrial and aquatic Endangered, Threatened, Proposed and Candidate species for the San Juan National Forest based on Information for Planning and Conservation (IPaC) website accessed 1 April 2019 from the U.S. Fish and Wildlife Service (consultation code: 06E24100-2019-SLI-0225)(event code: 06E24100-2019-E-00594).

<b>Species</b>	<b>Federal Status</b>	<b>Habitat present in treatment units</b>	<b>Carried Forward</b>	<b>Effects Determination</b>
Canada lynx	Threatened	Yes – Spruce-fir present	Yes	May effect, likely to adversely affect
New Mexico meadow jumping mouse	Endangered	No – suitable complex streamside riparian absent	No	No effect
Mexican spotted owl	Threatened	No- suitable habitat	No	No effect

Species	Federal Status	Habitat present in treatment units	Carried Forward	Effects Determination
		no present		
Southwestern willow flycatcher	Endangered	No – thick willow in adequate size absent	No	No effect
Western yellow-billed cuckoo	Threatened	No –gallery cottonwood absent	No	No effect
Colorado pikeminnow	Endangered	No – does not occur in Piedra River or Los Pinos watershed in Colorado.	No-There are no water depleting activities associated with the project.	No effect
Humpback chub	Endangered	No – does not occur in Piedra River or Los Pinos watershed in Colorado.	No-There are no water depleting activities associated with the project.	No effect

### Species Considered and Dismissed From Further Evaluation

#### New Mexico meadow jumping mouse (*Zapus hudsonius luteus*)

The New Mexico meadow jumping mouse (NMMJM) is listed as an Endangered species under the ESA in La Plata and Archuleta counties, Colorado (USDI 2013c). This species is restricted to complex riparian habitat with dense and diverse streamside vegetation over two feet tall and with a key habitat component of tall sedges, usually within 150 feet of permanent free-flowing water. They are found primarily in both streamside riparian and wet meadow habitats at low to moderate elevations (Morrison 1992). It is restricted to lowland valleys and montane stream courses in New Mexico, Arizona and extreme southwestern Colorado.

Jumping mice have been found at two locations in La Plata County, one at 6,800 feet and the other at 7,200 feet along the Florida River east of Durango (Frey 2008). A specimen was also collected along Sambrito Creek near the Colorado border with New Mexico in Archuleta County at an elevation of 6,100 feet (Frey 2008). In Colorado, Frey suggests that “Ideally, in the San Juan PLC [Public Lands Center] additional surveys should focus on areas below 7,611 feet, which was the upper threshold of the 95% confidence intervals for recent capture locations in the zone of sympatry [with *Z. h. princeps*]. However, areas up to ca. 8,000 elevation may also be

considered if the ecological situation seems appropriate (i.e., below the mixed coniferous forest zone, large area of potentially suitable habitat and presence of corridors to other potential areas (Frey 2011).”

Field visits to the proposed project area failed to locate any habitat considered suitable for the New Mexico meadow jumping mouse.

Design features of this proposal proscribe timber management activities within 300 feet of potential southwestern willow flycatcher habitat. Wetlands without flycatcher habitat would have a buffer zone distance equal to 2 times the maximum diameter of the wetland up to a maximum of 100 feet. Natural ponds and stock ponds would have a 150-foot buffer area around the outermost perimeter, i.e., high water line and any adjacent wetlands. There are no timber management units that occur in potential NMMJM habitat. Therefore, due to lack of habitat and no known nearby populations, the effects determination for this species is “no effect.”

### **Mexican spotted owl (*Strix occidentalis lucida*)**

Mexican spotted owls have been observed to nest, roost, forage and disperse among a wide array of biotic communities. The owl is typically considered a “habitat specialist” in that its roosting and nesting habitats generally occur in late seral forests or rocky canyon habitats. Some Mexican spotted owls undergo altitudinal migrations during winter to areas where habitat structure and composition differ from that used during breeding (USDI 2012). Dispersing juveniles can occur in a wide variety of habitats, including mixed conifer forests, pinyon-juniper woodlands and riparian areas surrounded by grasslands.

Mexican spotted owl habitat is limited by the availability of nesting and roosting habitat (Ganey and Balda 1994). Territories consist of a core of mature or late successional mixed conifer forest or steep, narrow, rocky canyons for nesting and roosting. These stands are typically on steep, north-facing slopes with complex structures including high snag and downed wood densities and very high canopy closures (USDI 2012). The Recovery Plan uses 100 acres as minimum patch size for nesting and roosting habitat within a minimum 600-acre protected activity center.

Between 1989 and 2003, a cumulative total of 495,905 acres had been surveyed to protocol standards on the San Juan National Forest without detecting a single verified Mexican spotted owl. Many areas were resurveyed several times. There has been only one confirmed occurrence of a Mexican spotted owl on the Forest, a nonbreeding second-year male found repeatedly in late-summer 2004 in the same general area on the Pagosa Ranger District. Additional surveys in 2005 failed to relocate this individual.

Based on field visits to the analysis area I have determined that the Baldy Mountain Salvage proposed treatment units contain no suitable habitat for Mexican spotted owls because there are no narrow rock-walled canyons with mature mixed-conifer forests nor is there any mapped Mexican spotted owl habitat. The treatment units contain primarily dead and dying spruce and fir, 58% of the entire analysis area, as a result of spruce beetle and fir engraver infestations. Therefore I conclude that the proposed action will have “no effect” on Mexican spotted owl and on owl habitat.

### **Southwestern willow flycatcher (*Empidonax traillii extimus*)**

Design features of this proposal require no prescribed fire or timber management activities within 300 feet of potential southwestern willow flycatcher habitat, if present. Wetlands would have a buffer zone distance equal to twice the maximum diameter of the wetland up to 100 feet.

Based on field visits to the project area I found no willow patches that were of sufficient size or stature to meet the current U. S. Fish and Wildlife Service definition of habitat for southwestern willow flycatcher (Finch and Stoleson 1999, USDI 2003). Southwestern willow flycatchers have never been documented in the area, nor on the Columbine Ranger District. Therefore, I conclude that the proposed action would have “no effect” on the southwestern willow flycatcher because there is no habitat in or immediately adjacent to the proposed timber treatment units.

### **Western yellow-billed cuckoo (*Coccyzus americanus*)**

The western yellow-billed cuckoo is listed as a Threatened species under the Endangered Species Act. Cuckoos have not been documented to occur on lands managed by the San Juan National Forest. There have been no confirmed cuckoo sightings in the Animas River Valley in decades.

There are no low-elevation gallery cottonwood forests with dense understory in the proposed timber treatment units. Because there is no habitat in or near the landscape, this proposal would have “no effect” to the western yellow-billed cuckoo nor its habitat.

### **Colorado pikeminnow (*Ptychocheilus lucius*) and razorback sucker (*Xyrauchen texanus*)**

The proposed action would not cause downstream impacts or result in additional water depletions from the San Juan River basins. Due to the absence of suitable habitat on the SJNF and lack of downstream impacts off of federal lands in the San Juan River basins, the proposed action would have “no effect” on Colorado pikeminnow and razorback sucker.

### **Cumulative Effects:**

Because there are no direct or indirect effects to the New Mexico meadow jumping mouse, Mexican spotted owl, southwestern willow flycatcher, western yellow-billed cuckoo, Colorado pikeminnow and razorback sucker, there are no cumulative effects.

### **Species with habitat in the proposed project area**

#### **Canada lynx (*Lynx canadensis*)**

The following section describes habitat associations and life history requirements for Canada lynx, status and distribution across Colorado and within the proposed project area and risk factors specific to the southern Rocky Mountains. Information used in this analysis is from existing information and on-site surveys conducted by agency resource specialists. Specific resources of note include the following:

Field reconnaissance by agency resource specialists in the snow-free season of 2019.

*Canada Lynx Conservation Assessment and Strategy (LCAS)* (Ruediger et al. 2000).

*Ecology and Conservation of Lynx in the United States* (Ruggiero et al. 2000).

Colorado Parks and Wildlife lynx database ([http://wildlife.state.co.us/species\\_cons/lynx.asp](http://wildlife.state.co.us/species_cons/lynx.asp)).

Biological Opinion for the Southern Rockies Lynx Amendment (USDI 2008).

Annual progress report for the post-release monitoring of lynx reintroduced to Colorado (Shenk 2010).

### *Habitat associations and life history requirements*

Canada lynx habitat in the Southern Rocky Mountains is naturally fragmented, a function of elevation, aspect and local moisture regimes. Primary lynx habitat is likely found within the subalpine and upper montane forest zones, typically between 8,000 and 12,000 feet. High alpine tundra environments and lower, open valleys define the upper and lower elevation boundaries of their habitat. Drier, south and west-facing slopes may also break up the continuity of the cooler, mesic high-elevation forest habitat utilized by lynx (Ruediger et al. 2000). Snow-tracking data indicate that Engelmann spruce and subalpine fir are the most common forest stands used by lynx in southwestern Colorado. Site-scale habitat data collected for lynx in Colorado indicate that lynx are commonly using forest stands that have Engelmann spruce present in the understory from the snow line to at least 3.8 feet above the snow; thus lynx are using areas that provide winter browse for snowshoe hare (Shenk 2001).

The density of lynx in an area is highly dependent on prey abundance. Home ranges of lynx are generally larger in southern habitats, where snowshoe hare densities are low. In western Wyoming, home ranges are approximately 42 square miles for males and 35 square miles for females (Squires and Laurion 2000). Lynx appear to remain close to their established home ranges in the winter and exhibit more extensive, exploratory movements in the summer (Squires and Laurion 2000, Shenk 2001).

### *State-wide population status and distribution*

In an effort to establish a viable population of lynx in Colorado, Colorado Parks and Wildlife (CPW) began the initial transplanting of 96 lynx in 1999 and 2000 into a core area of southwestern Colorado. From 1999 to 2006, CPW released 218 wild caught lynx into Colorado.

Most of the released lynx remain in the core area: New Mexico north to Gunnison, west as far as Taylor Mesa and east to Monarch Pass. Some movement of lynx in Colorado has occurred north of I-70 and into Utah, Wyoming, New Mexico, Nebraska and Montana (Shenk 2006).

Reproduction was first observed in 2003, then in 2004, 2005, 2006, 2009 and 2010. No dens were documented in 2007 or 2008. No current information about the reproductive success or whereabouts of these kittens are available.

From 1999 until June of 2010, there were 122 known mortalities of released adult lynx. Mortality factors were as follows; 29.7% attributed to collisions with vehicles or gunshot

wounds, starvation and disease/illness accounted for 18.6% of the deaths while 37.3% were unknown (Colorado Parks and Wildlife 2010).

The Fish and Wildlife Service is proposing to draft the rule to de-list this fall and publish the proposed rule in the federal register. A decision is anticipated sometime in 2020.

### *Environmental baseline*

The area currently occupied by this Lynx Analysis Unit probably experienced a large scale stand replacing fire just prior to the turn of the 20<sup>th</sup> century. It is likely that the fire resulted in large areas of the forest in stand initiation structural stage. This fire probably converted significant portions of the slope to aspen from a spruce-fir forest. The event also likely removed considerable sums of lynx habitat. Smaller lightning strike fires probably regularly occur on the slope resulting in small openings, adding to the diversity of structural stages that lynx sometimes use.

More recent fires have been a significant factor in the condition of this LAU. The Missionary Ridge Fire of 2002 burnt approximately 4,232 acres of the Lower Pine River LAU. That fire, like most wildfires of its size, varied greatly in the intensity across the area affected. Some portions of the fire were stand replacing, while others were a light ground fire and intermediate levels of intensity also occurred. There have been no major wildfires in the Lower Pine River LAU since the Missionary Ridge Fire. Small single tree and less than one acre wildfires are common in this LAU.

Timber harvest activities have occurred in the Lower Pine River LAU. Approximately 5,507 acres have been harvested. The Lower Pine River LAU has had seven timber sales since 1970. The earliest sale was Beaver Meadows 1 & 2, it was a shelter wood preparatory cut followed by a clearcut on approximately 251 acres taking place from 1965 to 1970. In 1987 through 1988 the West Prong Timber Sale harvested 1,484 acres in a largely group selection, sanitation and commercial thinning prescription. The West Prong Sale was followed by the Indian Creek Timber Sale of 1991 through 1992. That sale harvested approximately 525 acres in a group selection, improvement and sanitation cut. The Red Creek Timber Sale of 1993 through 1995 was mostly a patch clearcut method of harvest with some group selection cuts and a permanent clearing for a total treatment area of 117 acres. The Dead End group selection and sanitation cut followed in 1995 and 1996 with a total area treated of 260 acres. The most recent and final treatment in the Lower Pine River LAU was a 197 acre sanitation cut that occurred in 1996.

In 2018, the Vallecito-Piedra Integrated Vegetation Management project started to be implemented. That project is harvesting 1,492 acres of currently unsuitable lynx habitat (stand initiation stage). Approximately 900 acres of that total is adjacent to the proposed project area. Informal consultation on the VPIVM proposal, referenced on page 12 of the Federally Listed Section of this BA, resulted in a “may effect, not likely to adversely affect” determination due to potential disturbance of lynx that may use adjacent suitable lynx habitat.

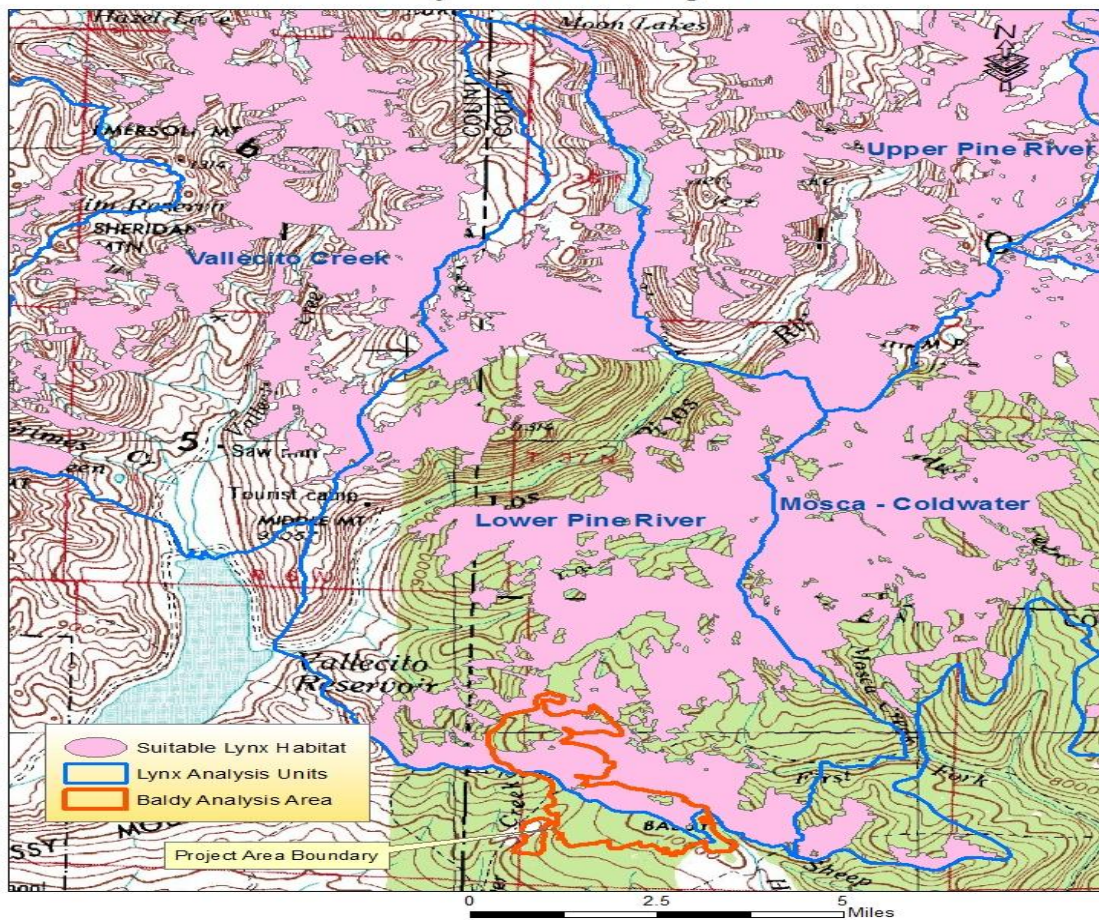
The analysis area is entirely in the Lower Pine River LAU (21333). The following Table 4 and Map 3 are provided to display the condition of the Lower Pine River LAU. This landscape is not in a mapped linkage area. These numbers reflect the current condition including losses of habitat identified during the preparation of the recent salvage sale in Trout Creek and Slide Mountain, a part of the Vallecito-Piedra Integrated Vegetation Management Project (VPIVM), evaluated in

2017 reference ES:/CO: FS/SJNF/Columbine RD. (TAILS 06E24100-2017-I-0287/65413-2009-B-0008).

**Table 4. Lower Pine River LAU current condition.**

Name	LAU #	Gross LAU Acres	LAU Net FS Acres	Suitable Acres	Stand Initiation Acres	Total Lynx Habitat	Percent Unsuitable	Acres Non-Habitat
			FS Acres	Within LAU on FS land, Suitable Lynx Habitat	Within LAU on FS land, Unsuitable Lynx Habitat	Within LAU on FS land, Suitable and Unsuitable Lynx Habitat	Stand Initiation Acres / Total Lynx Habitat	LAU FS acres minus LAU Lynx Habitat Acres
Lower Pine River	21333	45,418	42,884	22,133	2,541	24,674	10.3%	18,210

**Map 3. Lynx Habitat in Suitable Condition, LAUs and Baldy Mountain Salvage Units**



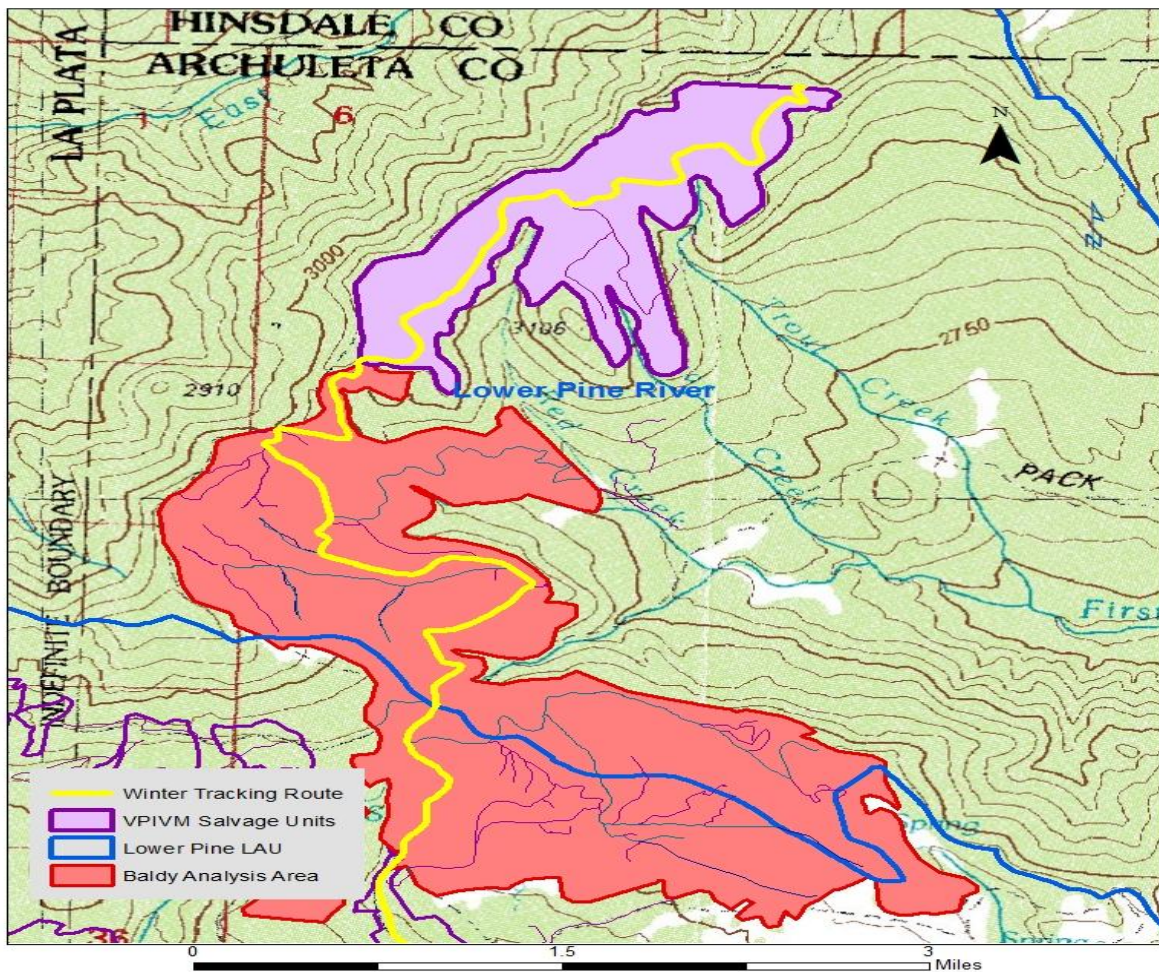
The Southern Rockies Lynx Amendment established Forest-wide exceptions and exemptions caps. To date a total of 148 acres have been treated under the Pagosa Creek, 2011, and the Fall Creek Spruce Salvage Sale of 2017 exception 3 to VEG S5. The Forest's cap is 5,243 acres. Use of the exceptions resulted in 5,095 acres of cap remaining on the Forest (U.S. Fish and Wildlife 2008, USDI 2017a). Acres of total treatment under exception and exemption to VEG S1, S2, S5 or S6 (4.5% of lynx habitat) would be a total of 148 acres from the Forest's allocation of 47,186 or a balance of 47,038 acres. Standards VEG S1, the 30% unsuitable standard and VEG S2, the rate of change standard, are both being met as evidenced in the "Percent Unsuitable" column in the preceding table. This project is not proposing to use any exceptions or exemptions.

The Lower Pine River LAU is experiencing significant spruce beetle and mountain beetle infestations; most of the mature spruce and fir in the western portion of the Lower Pine River LAU is infested with the beetle. Most of the area is exhibiting the telltale indication of death by having their needles turn grey. Among apparently live spruce, pitch streamers, pitch tubes and boring dust on the exterior of most mature spruce trees is evident and widespread. The mapping displayed below of spruce and mountain beetle activity do not fully depict the extent of the spruce beetle infestation as the most recent data is from 2014 for spruce beetles and 2017 for mountain beetles. Most stands immediately adjacent to this proposal are at 90% mortality of the canopy spruce trees.

The Ecology and Conservation of Lynx in the United States describes lynx populations in most southern boreal forests as having hare densities similar to those occurring during population lows in the north (Aubry, Koehler and Squires 2000,). As this LAU is at the extreme southern boundary of lynx in Colorado, it is likely that hare densities are usually near the lower limit of what is necessary to sustain lynx. Recent spruce beetle activity in this LAU has most likely contributed to reduced snowshoe hare and pine squirrel density, the latter being lynx's alternate prey species. The Forest Service conducted track surveys in the lower (southern) portion of this LAU for 13 years from the winter of 2004 to as recently as 2018. Map 4 depicts the survey route relative to the proposed project area. For the span of these surveys, the average detection rate for hares were 35.2 per four miles of survey route. In 2018, when spruce tree mortality due to the spruce beetle was very evident, only 28% of the average number of hares were observed. During

the period of those surveys, only one lynx track was observed in February of 2009.

**Map 4. Beaver Meadows Winter Tracking Route**



Lynx's alternate prey, squirrels, are likely to decline precipitously as a result of spruce beetle activity. O'Donoghue (1997) found red squirrels were the main alternate prey of lynx during periods of hare low abundance (Ruediger et al. 2000). With almost all of the overstory dead in the proposed project area, the cone crop in future years would be reduced from what it was prior to the beetle outbreak. Consequently, within the area affected by the spruce beetle and proposed for salvage, the alternate prey species for lynx are likely to be at very low levels. Pine squirrel detections during the survey cited in the previous paragraph were 44% of their 13 year average (winter of 2004/5 to 2018). Lynx would be unlikely to be able to rely on pine squirrels to compensate for the loss of snowshoe hare abundance.

The Lower Pine River LAU is used for several commercial activities permitted by the Forest Service. Approximately 18,290 user days of outfitter and guide activities occur in this LAU. The breakdown of these commercial activities expressed in user days is as follows; fishing, 10, kayaking, 50, hunting, 1,892, trail rides, 1,488 and guided hiking, 1,458.

The Lower Pine River Lynx Analysis Unit has six grazing allotments, which overlap portions of the LAU. The following Table 5 and Map 5 describes current stocking rate and on/off dates.

**Map 5. Lower Pine River LAU - Allotments and Baldy Mountain Salvage Proposed Project**

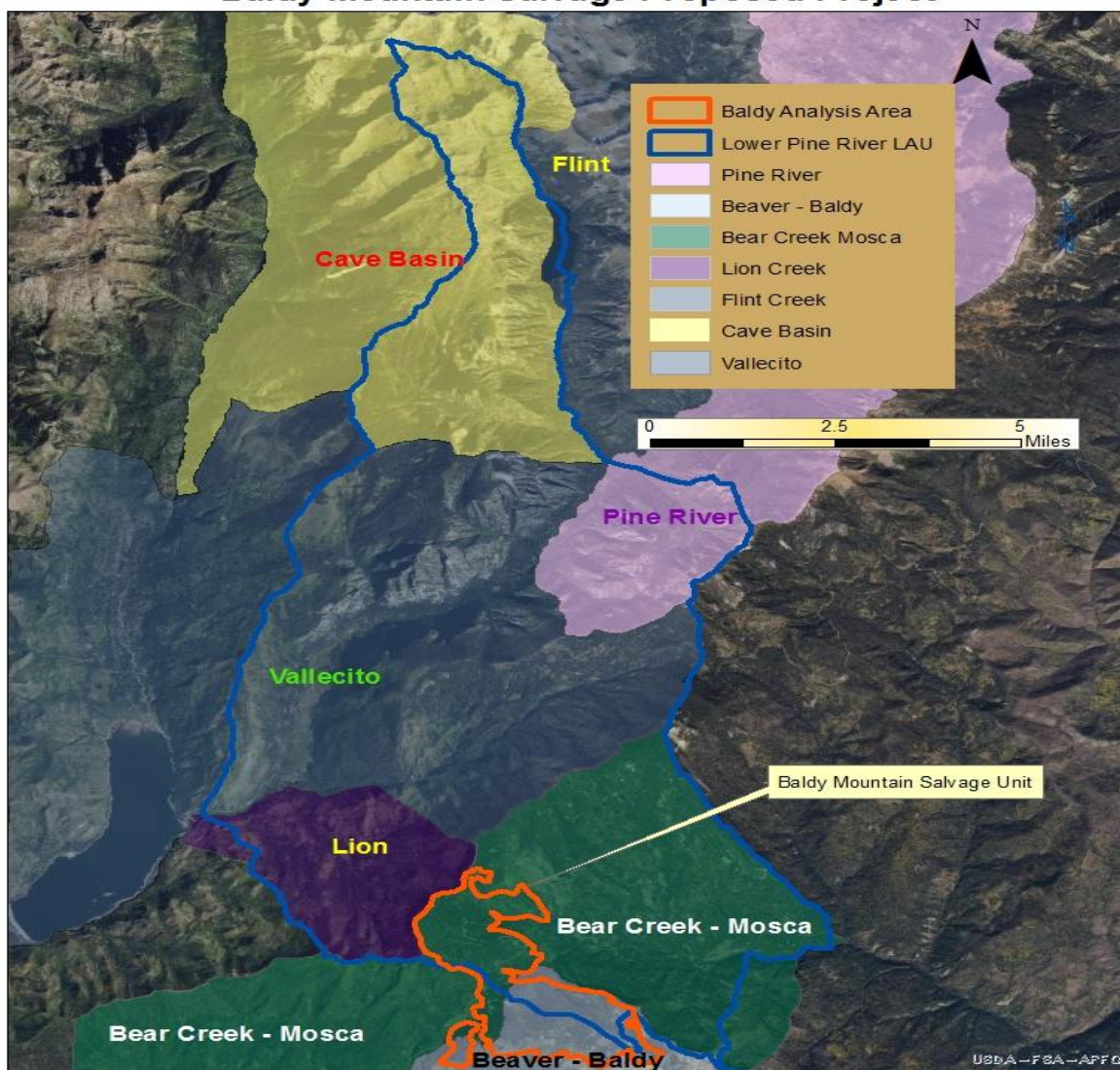


Table 5. Cattle use in the Lower Pine River LAU.

	Stocking Rate	On / Off Dates
Flint Cr.	Vacant Allotment	Vacant Allotment
Cave Basin	Vacant Allotment	Vacant Allotment
Vallecito	386 C/C	06/21 – 10/12
Lion Cr.	150 C/C	06/15 – 10/15
Bear Cr. Mosca	636 C/C	06/15 – 10/15
Beaver – Baldy*	407 C/C	06/15 – 10/15

\*Although the Beaver – Baldy Allotment is authorized for 407 cow/calf (c/c) pairs, the permittee has never reached this limit.

General use by the public such as snowmobile activity, hiking, OHV use, firewood gathering, passenger vehicle use, biking, snowshoeing, brush clearing along roadsides, hunting and the fishing effort in this area are difficult to quantify. However the lower portions of this LAU experience high recreational use. It is likely that sources of human noise and activity in this project area are frequent.

### *Direct and Indirect Effects*

The Lower Pine River LAU includes all lynx habitat affected by the Baldy Mountain Salvage Sale proposal. Approximately 1,835 acres of this proposal are within the LAU representing approximately 4.0 % of the total acres of lynx habitat in the LAU.

The Forest Service proposes to harvest as much as 2,400 acres of spruce, fir and some aspen within the BMSS proposed project area. Of the 1,835 acres within the LAU, 1,422 acres are currently mapped as suitable lynx habitat, an additional 364 acres are currently in an unsuitable condition and approximately 50 acres are non-lynx habitat. Table 4, located in the *Environmental Baseline* section, reflects the current balance of lynx habitat in the LAU.

The Forest Service proposes to conduct treatments of the vegetation; salvage of dead trees and removal of live spruce, fir and some aspen trees within the 1,422 acres mapped as suitable lynx habitat. As these treatments include varying amounts of live tree removal dependent upon the percentage of spruce beetle activity in the stand at the time of harvest, considerations for removing live trees prone to wind-throw and those in declining or poor condition as well as incidental damage to understory trees that would occur during harvest, this proposal would convert the suitable lynx habitat stands to unsuitable lynx habitat.

Although there would be some young spruce and fir trees surviving the beetle outbreak and that would not be damaged due to this treatment nor harvested due to their vigor and wind-firm potential, the amount of forage and hiding cover for snowshoe hare is likely going to be scarce and distant between single and small groups of trees. With a mean snow depth of 1.5 meters, there may not be adequate green growth within three feet of the snow surface to support a snowshoe hare population sufficiently abundant to sustain lynx. Lynx would likely avoid the area as adjacent untreated stands would provide better foraging habitat. Although it is the case that adjacent stands are also experiencing spruce and pine beetle infestations as well as fir-engraver damage, contributing to the overall poor condition of lynx habitat in this area.

Loss of lynx habitat may make foraging, especially during the winter months, more difficult for lynx as there would be less vegetation in a condition to support adequate densities of snowshoe hares for lynx foraging. Removal of live canopy trees would also reduce the availability of trees suitable for pine squirrels, lynx alternate prey species. Any lynx that may use this area are likely traveling further to acquire adequate resources to sustain themselves. Increases in travel distance for foraging purposes may also increase exposure of lynx to predation. Total suitable habitat in the LAU would decline from 22,133 acres to 20,711 acres, currently unsuitable habitat within the LAU would increase to 3,963 acres. The percentage of national forest administered lands in stand initiation stage for this LAU would change from 10.3 to 16.0.

There is approximately one mile of temporary road proposed within the LAU that is also occurring in suitable lynx habitat. The habitat loss due to the temporary road construction is included in the harvest figures calculated in the preceding paragraph. Temporary roads would be

ripped for their entire length to avoid the negative consequences of compaction on subsequent vegetation growth and density.

From a disturbance standpoint, the activity associated with a timber sale, including use of roads otherwise open to the public, temporary roads in the project area specific to the timber sale and harvesting activities, this proposal would likely cause lynx to avoid areas adjacent to the proposed project during active operations. This proposal is likely to be implemented over the next five to ten years. Lynx that may be present would likely avoid the proposed project area during active operations to avoid perceived danger from human activity.

#### *Endangered Species Act Cumulative Effects*

Cumulative effects covered in this section include the effects of future state, tribal, local or private actions that are reasonably certain to occur in the action area considered in this BA. Future federal actions are not considered in this section because they require separate consultation pursuant to section 7 of the Endangered Species Act.

There are no state and no tribal lands in the Lower Pine River LAU. Approximately 2,235 acres of private land does occur within the LAU, approximately 1.8 miles distant from this proposed project. Any activity and loss of lynx habitat such as construction that occurs would be very minor, most likely upkeep of existing structures and would be insignificant to Canada lynx, if present.

#### *Effects Determination*

Approximately 1,422 of suitable lynx habitat would be converted to stand initiation stage by this proposal due to the removal of live spruce, fir and some aspen trees as well as incidental damage and wind-throw effects to the residual stand. There would also likely be disturbance associated with the harvesting of spruce and fir trees because the harvest is immediately adjacent to suitable lynx habitat, although those stands too are affected by spruce and pine beetles and fir-engravers. Lynx alternate prey, pine squirrels, would also likely be less available to lynx as a result of this proposal. The Baldy Mountain Salvage Sale proposed project is likely to make foraging for lynx more difficult and possibly expose lynx to predation that they otherwise could avoid. Therefore, the effects determination is “**may affect, is likely to adversely affect**” the Canada lynx.

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